

SIDS Lighthouses Initiative

Progress and way forward

January 2021



List of Abbreviations, SIDS Lighthouses

ADFD	Abu Dhabi Development Fund for Development	NDC	Nationally determined contribution
AIS	Atlantic, Indian Ocean and South China Sea	NGO	Non governmental organisation
AOSIS	Alliance of Small Island States	ODA	Official development assistance
CARICOM	Caribbean Community	OEE	Ocean Energy Europe
CDB	Caribbean Development Bank	PPA	Power purchase agreement
CIP	Climate Investment Platform	PV	Photovoltaic
COE	Centre of excellence	QI	Quality infrastructure
GGA	Global Geothermal Alliance	REMap	Renewable Energy Roadmap
GCF	Green Climate Fund	RRA	Renewables Readiness Assessment
GHG	Greenhouse gas	SEC	Seychelles Energy Commission
GW	Gigawatt	SEforAll	Sustainable Energy for All
GWEC	Global World Energy Council	SIDS	Small Island Developing States
IRENA	International Renewable Energy Agency	S.A.M.O.A	SIDS Accelerated Modalities of Action
IRIE	Initiative for Renewable Island Energy	TWI	Terawatt Initiative
kWp	kilowatt-peak	UNDP	United Nations Development Programme
LHI	Lighthouses initiative	UN-OHRLLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.
LAC	Latin America and the Caribbean	VRE	Variable renewable energy
MARENA	Mauritius Renewable Energy Agency		
MOU	Memorandum of understanding		
MRV	Monitoring, reporting and verification		
MW	Megawatt		

“Both national and regional initiatives have been ambitious and encouraging, particularly in terms of attracting the interest and support of international players and agencies like IRENA. These partnerships have been highly valuable and continue to play a significant role in our policy development and implementation on all levels.”

Hon. Henry Puna, Former Prime Minister of the Cook Islands

Despite the COVID-19 pandemic, small island developing states (SIDS) have continued striving to address their energy challenges, mitigate the adverse impact of climate change and unleash sustainable economic development.

Hand in hand with their development partners, these islands have set out to enhance their commitments under the Paris Agreement and submit enhanced climate pledges.

Renewable energy technologies, combined with steadily improving energy efficiency, can achieve transformational socio-economic impacts for small island economies and societies. Renewable resources – including solar, wind, geothermal, ocean energy, hydropower, modern bioenergy and green hydrogen – can ensure energy security, strengthen economic recovery, and provide a wide range of socio-economic benefits.

Renewable energy development is also key to developing measures for climate resilience, mitigation and adaptation, helping small islands fulfil ambitious climate goals consistent with holding the rise in average global temperatures at 1.5°C.

The international community can help make 2021 a year of renewed opportunity for SIDS economies and societies, which continue to demonstrate consistency, vigour and remarkable forethought towards their future generations.

This report provides an overview of progress achieved since the initiative's launch. It also highlights key developments in the energy transformation undertaken jointly by SIDS and development partners, as shared with IRENA and featured on the associated knowledge-sharing platform.

*Launched in 2014, the initiative responds
to a call for action under the SIDS
Accelerated Modalities of Action
(S.A.M.O.A) pathway.*

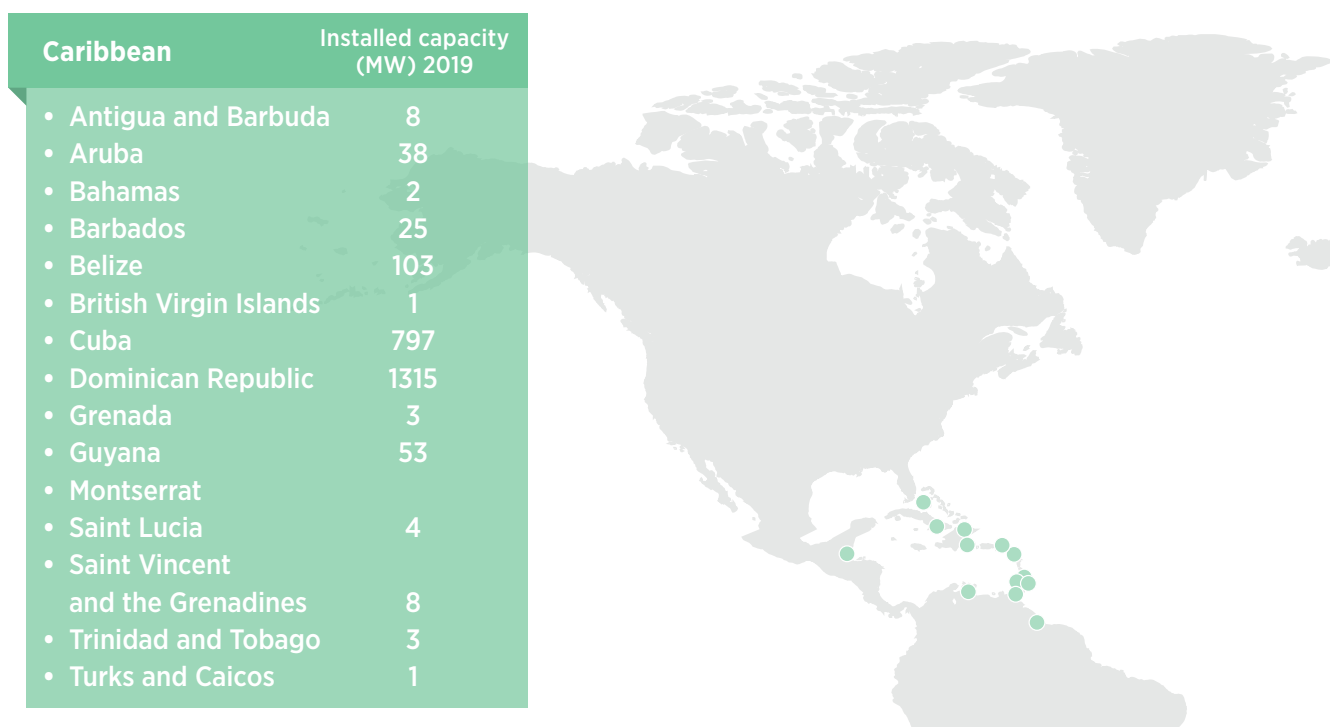
SIDS and other partners

The SIDS Lighthouses initiative brings together 36 SIDS from the Caribbean, the Pacific, and the Atlantic, Indian Ocean and South China Sea (AIS) regions, along with 30 other partners. The latter include developed countries, regional and international organisations, development partners, private companies, research institutes and non-profit organisations.

Five new partners joined the initiative in 2020: Greening the Islands, the Pacific Community, the Pacific Power Association, Sur Futuro Foundation, and the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS).

As the initiative’s co-ordinator, IRENA facilitates and enhances dialogue at all levels, including through co-operation with other SIDS-related initiatives. These include **Ambitious SIDS Climate Action**¹ and the **Initiative for Renewable Island Energy** (IRIE).

Figure 1 **Total installed renewable energy capacity (MW) of SIDS and other initiative partners, 2019**



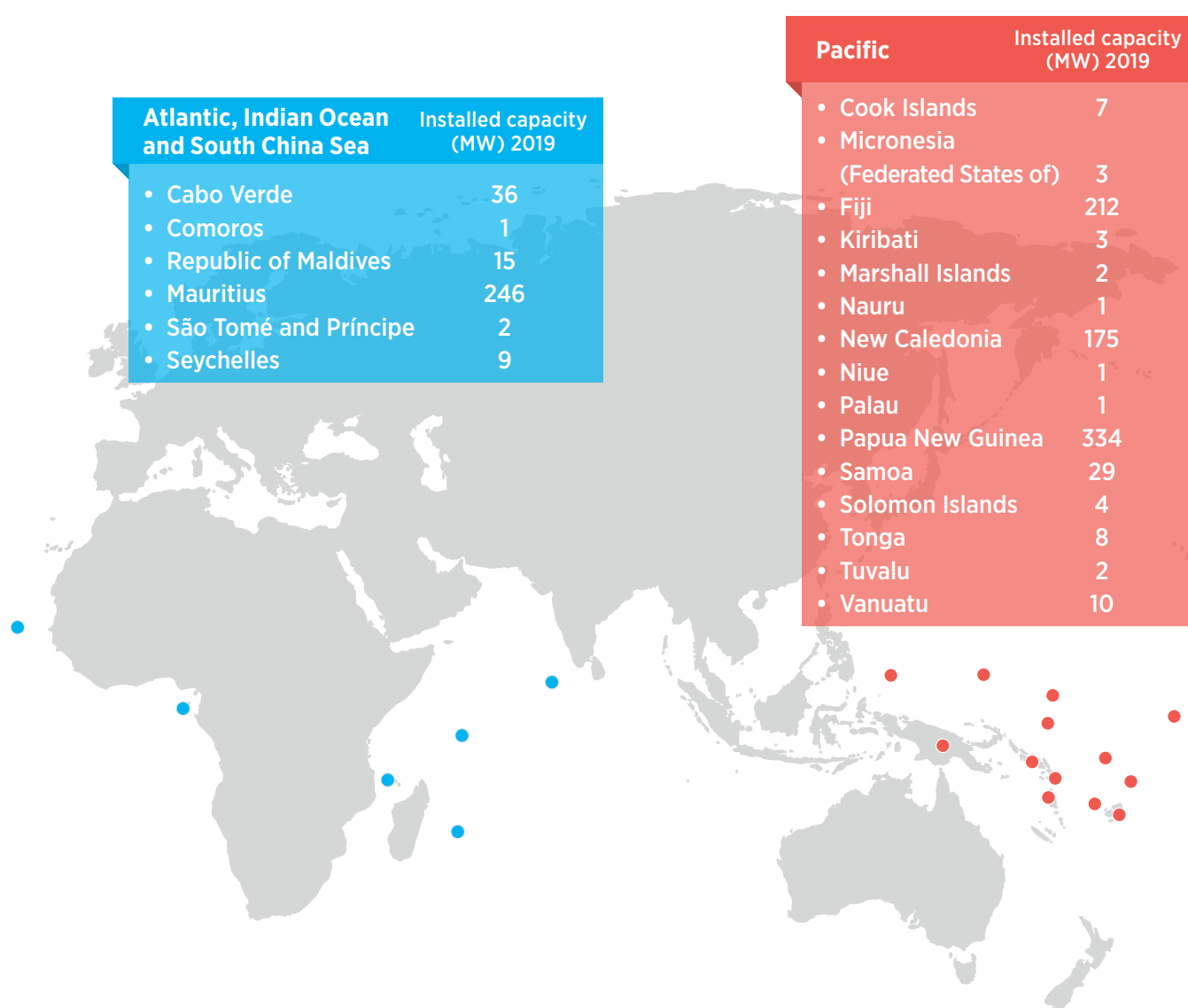
Other partners

Denmark, France, Japan, Germany, Italy, New Zealand, Norway, United Arab Emirates, United States of America, Association of the Overseas Countries and Territories of the European Union, Caribbean Electric Utility Services Corporation, Clean Energy Solutions Center, Clinton Climate Initiative, ENEL, European Union, Greening the Islands, Indian Ocean Commission, International Renewable Energy Agency, Organisation of Eastern Caribbean States, Pacific Islands Development Forum, Pacific Community, Pacific Power Association, Rocky Mountain Institute - Carbon War Room, Solar Head of State, Sustainable Energy for All, Sur Futuro Foundation, United Nations Development Programme, United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, World Bank.

¹ Known in full as the *Ambitious SIDS Climate Action Summit Package: Accelerating Sustainable Energy in SIDS to achieve Enhanced and Ambitious Energy Transition Targets by 2030*.

Joining the Initiative

The SIDS Lighthouses Initiative is an inclusive and neutral multi-stakeholder platform that brings together public, private, inter-governmental and non-governmental actors. Participating SIDS and other partners share a common vision of accelerating energy transformation to bolster climate resilience and sustainable development. All SIDS and development partners are invited to join this initiative and can acquire more information at: <https://islands.irena.org/>; or contact: islands@irena.org.



*Disclaimer: Boundaries and names shown on this map do not imply any official endorsement or acceptance by IRENA.
Based on IRENA analysis*

Progress since 2014

Since the launch of the initiative in 2014, renewable energy uptake in SIDS has been impressive. The bold vision of SIDS' leaders and their resolve, together with the evolution of technology, cost reductions and the support of a wide range of partners, have made renewables an affordable and reliable energy option.

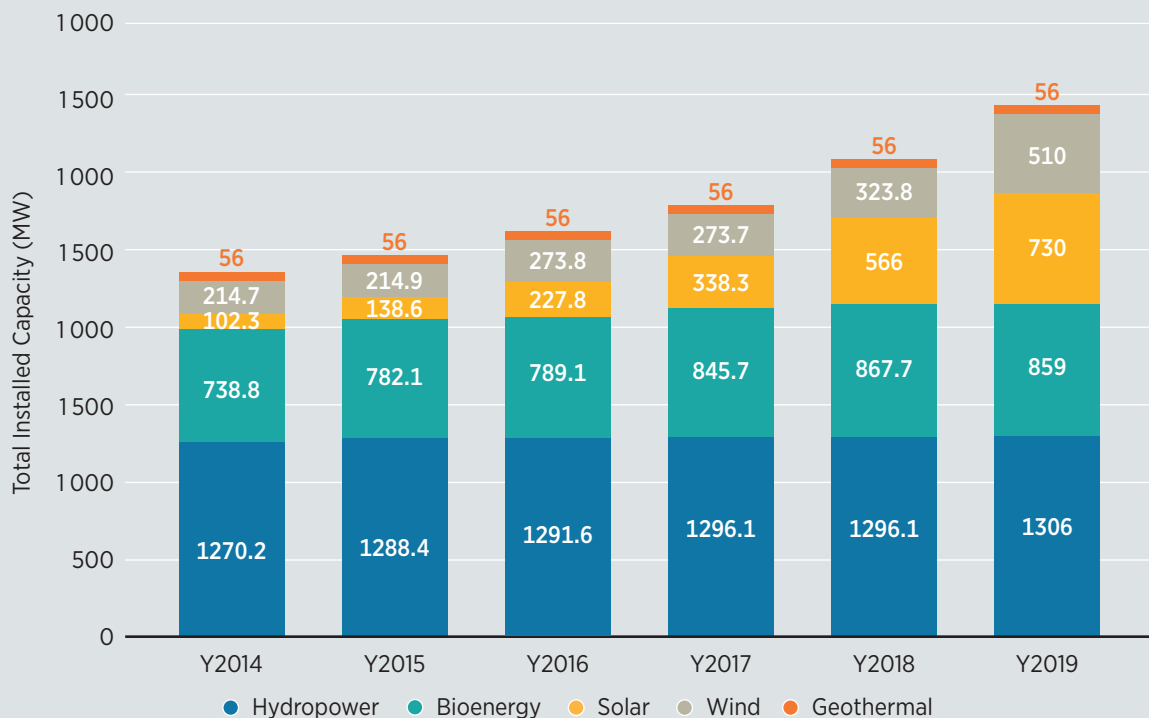
According to IRENA data, the total installed capacity of renewables for all SIDS accounted for around **5.3 gigawatts (GW) at the end of 2019**, of which 1.8 GW had been installed since 2014. Those new installations included more than 1.1 GW of solar photovoltaics (PV), 380 megawatts (MW) of wind, 60 MW of hydropower and 215 MW of bioenergy.

Update on SIDS Lighthouses initiative partners: Installed capacity and roadmaps in 2020

The 36 SIDS Lighthouses initiative partners accounted for a total installed capacity of **3.5 GW by the end of 2019**. New capacity additions in 2019 exceeded 350 MW, including 186 MW of wind and 164 MW of solar power.

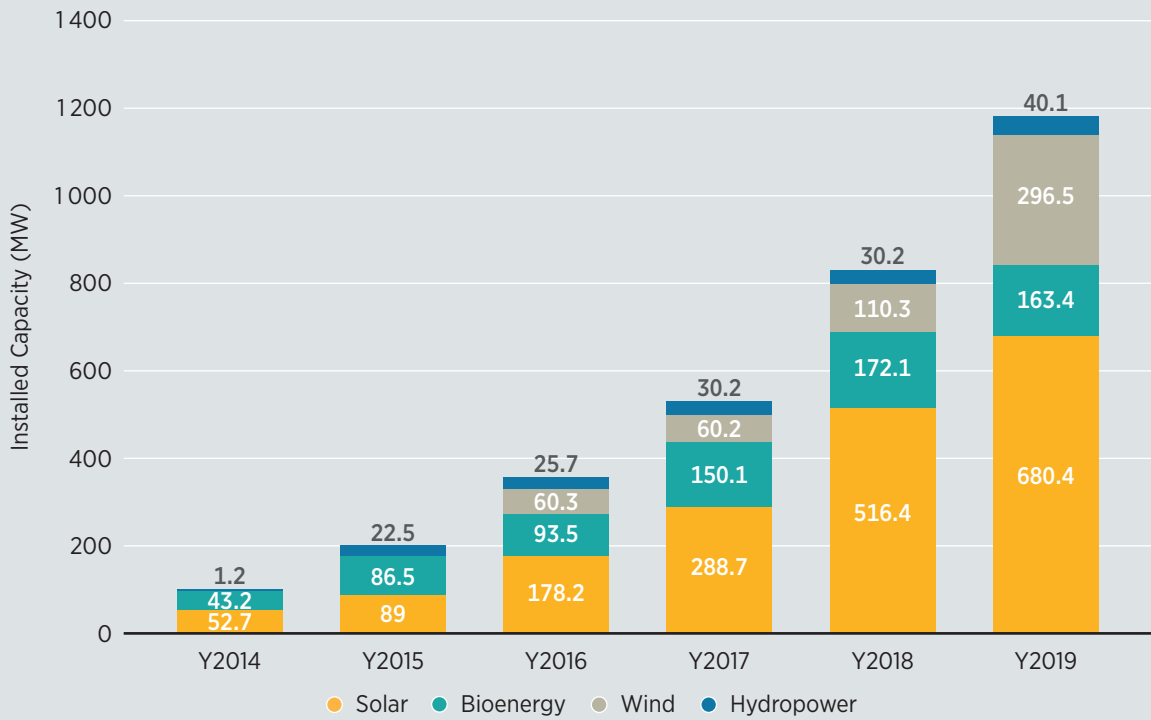
All the SIDS partners have included renewable energy as an important component in their national energy policy frameworks, roadmaps and low emission development strategies. Given that NDCs are currently being updated, it is expected that renewable energy targets will also increase, with more SIDS aiming for net zero emissions mitigation goals largely made up of renewable energy and energy efficiency measures.

Figure 2 **Total installed renewable capacity for SIDS that are initiative partners: 2014-2019**



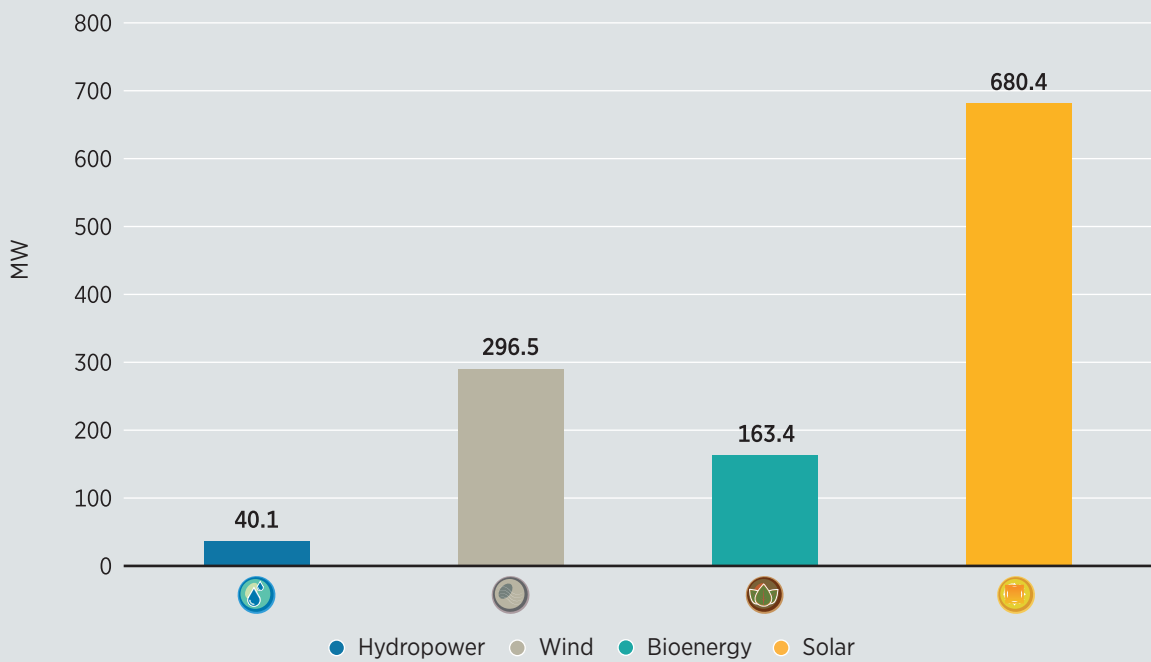
Source: IRENA statistics for SIDS.

Figure 3 **New cumulative renewable energy installations (starting year 2014)**



Source: IRENA statistics for SIDS.

Figure 4 **New installed renewable energy capacity by technology in SIDS that are initiative partners: 2014-2019**



Source: IRENA statistics for SIDS.

In recent years, SIDS have gained access to:

- **Support for the enhancement and implementation of their NDCs.**
- **Capacity building** for local policymakers, utilities, private sector, financing institutions and other relevant actors in accelerating energy transformation in SIDS.
- A platform to share **information, knowledge, lessons learned and good practices.**
- **Policy, regulatory and advisory services** to accelerate the uptake of renewables through the development of roadmaps, resource assessments, grid stability analysis, project planning, identification, execution and sustainability.
- **Investment** in terms of ensuring project bankability, which attracts financing to support energy transformation in SIDS.

IRENA high-level dialogues

As the co-ordinator of the SIDS Lighthouses initiative, in June 2020, IRENA convened a high-level dialogue in collaboration with the Alliance of Small Island States (AOSIS). This aimed to identify pathways to accelerate energy transformation in SIDS and stimulate post pandemic economic recoveries.

Key messages from SIDS and development partners were:

- A focus on renewable energy to support end-use sectors. These include: water, which is often amongst the largest consumers of electricity; the transportation sector, given its high share of oil imports; agriculture, given that the food import bill is substantial; the tourism sector, which was severely impacted by the COVID-19 pandemic; and the health sector, to ensure people's wellbeing and safety through efficient healthcare services.
- Undertaking measures to improve SIDS' access to affordable financing. Revising official development assistance (ODA) eligibility rules, as well as supporting financing options, such as blended finance and de-risked investments, will help solve some of these issues. This will also conversely be solved by increased efforts in multilateralism, partnerships, and international solidarity.



SIDS leaders and representatives of development partners participating in the IRENA-AOSIS high-level dialogue in June 2020

NDC enhancement and implementation

Engagement with other SIDS-focused initiatives

Renewables have been recognised as a crucial pathway to strengthen resilience against the impact of climate change and to pursue socio-economic development in SIDS.

The SIDS Lighthouses initiative has therefore been operationalising the Ambitious SIDS Climate Action package and the IRIE as a response to the call to action by SIDS leaders to accelerate sustainable energy in their countries. This is being done through the S.A.M.O.A. pathway, which supports SIDS in the enhancement and implementation of their commitments under the Paris Agreement, as well as in the achievement of the 2030 Sustainable Agenda for Sustainable Development.

The Ambitious SIDS Climate Action Summit package: Accelerating Sustainable Energy in SIDS to achieve Enhanced and Ambitious Energy Transition Targets by 2030

The Ambitious SIDS Climate Action Summit package is being put into effect through the SIDS Lighthouses initiative. The package sets a pathway of enhanced renewable energy targets by 2030 that delivers ambitious political action to support the aim of achieving as much as 100% renewables and energy efficiency targets. It focuses, in particular, on: power sector 2030 goals; enhanced and targeted financing and increased access to de-risked financing solutions; and the accelerated delivery of technical assistance and capacity building activities. These aim to: support NDC enhancement in the energy sector; develop energy action and assessment plans; enhance new sustainable energy policies and regulatory frameworks; streamline business and economic models; and enhance multi-stakeholder partnerships to contribute to the development of public-private mechanisms.

Denmark and IRENA co-organised a webinar on 15 September 2020, entitled *Energy Transformation in SIDS: Towards Sustainable and Climate Resilient Post-Pandemic Recovery*. At this, SIDS and their development partners reiterated that the shift to renewables is the best remedy to address both the ongoing climate and COVID crises. Participants also stressed that SIDS need immediate support to respond to the pandemic-inflicted economic and financial crises, with a focus on the energy-health-water-food nexus, tourism sector and debt relief strategies.

The event followed from the United Nations Secretary General's Climate Action Summit 2019, for which the energy track has continued to be led by Denmark and Ethiopia, with support from Sustainable Energy for All (SEforAll).

IRIE, in co-ordination with Maldives

Building on the successful, first IRIE ministerial meeting – organised in 2017 by IRENA and the Maldives government, in its capacity as chair of AOSIS – the SIDS Energy Day followed at COP23. The SIDS Lighthouses initiative is working closely with the Maldives, SIDS and development partners in strengthening political engagement, garnering technical support, project facilitation and access to finance, while strengthening partner co-ordination and collaboration. The high-level participants reaffirmed the importance of a genuine and durable partnership in achieving energy transformation in SIDS to support NDC enhancement and implementation. Ministers also reaffirmed the importance of such a partnership in achieving the overall objectives of IRIE.

Latest updates on SIDS Lighthouses

The political commitment to renewables among SIDS remains unwavering. Given the evolving energy needs of these states and the commitment of their development partners to advancing energy transformation through the implementation of their NDCs, strengthening collaboration and establishing durable and genuine partnerships is essential.

Many SIDS have set significant targets for the uptake of renewables in their national energy policies and strategies, in addition to the commitments they have made under the Paris Agreement through their NDCs. Initiative partners have also stressed the importance of moving beyond the power sector to look at adaptation measures that also address food and water security, healthcare and tourism. At the same time, these must also help achieve multiple economic, social and climate goals. This is reflected in the priority areas that were developed and adopted by all the initiative partners in September 2018.

Priority areas:

- Support SIDS in **reviewing and implementing NDCs**, extending **technical assistance** and **capacity building** where needed to meet climate goals.
- Expand from assessment and planning to **implementing effective, innovative solutions**, with continued **technical and regulatory advisory services** addressing the challenges faced by SIDS.
- Promote **all renewable sources**, including geothermal and ocean energy, and step up work to integrate solar PV and wind power.
- Support the **development of bankable projects**, fostering **access to finance** and closer **co-operation with the private sector**.
- Strengthen institutional and **human capacity development** in all segments of the renewable energy value chain.
- Look beyond power generation and focus also **on transport and other end-use sectors**.
- Leverage **synergies** between **renewables** and **energy efficiency**.
- Reinforce **links between renewables and non-energy sectors** – including **agriculture, food, health and water** – to foster broad **socio-economic development**, while also raising awareness about **job creation, gender equality and women’s empowerment** through renewable energy development.
- Link renewable energy uptake to **climate resilience and more effective disaster recovery**.
- Enhance the collection and dissemination of **data and statistics**, particularly to ensure informed decision-making and effective monitoring.
- Reinforce and expand **partner engagement**, leveraging synergies with existing SIDS initiatives and other IRENA-facilitated platforms, such as the Global Geothermal Alliance, the International Off-Grid Renewable Energy Conference, and IRENA Coalition for Action.
- Boost **renewable power deployment**, aiming for total installed capacity of 5 GW in SIDS by 2023.

Implementing and enhancing SIDS climate pledges

In partnership with the United Nations Development Programme (UNDP), the NDC Partnership and other organisations, IRENA is supporting 20 SIDS in their NDC enhancement and implementation.

These include Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, the Dominican Republic, Fiji, Grenada, Guyana Nauru, Papua New Guinea, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Seychelles, Tonga, and Vanuatu.

NDC enhancement and implementation activities include: the development of an energy management methodology for greenhouse gas emissions (GHGs); target tracking; roadmaps for the electrification of the transport sector; roadmaps for emerging technologies, such as green hydrogen and ocean energy; rooftop solar simulation; energy monitoring, reporting and verification (MRV); mitigation scenarios; project facilitation; and access to finance.

Current activities in support of SIDS NDC enhancement and implementation

Through the SIDS Lighthouses initiative, the Climate Promise, the Climate Action Enhanced Package and the Ambitious SIDS Package, IRENA is supporting 20 SIDS in their NDC enhancement and implementation, via the following activities:

- Energy data management for GHGs and NDC target tracking for Papua New Guinea.
- Roadmap for the electrification of the transport sector and decarbonisation of the power sector by 2030 for Antigua and Barbuda.
- Review of energy data management methodology and the Climate Change Policy for Fiji.
- Rooftop solar simulation analysis for Saint Lucia and Seychelles.
- Capacity building for climate finance tracking for Seychelles.
- Support on energy data management methodology, development and implementation of the energy MRV for Belize, Dominica, Guyana, Papua New Guinea, Saint Kitts and Nevis, Saint Vincent and the Grenadines, and Tonga.
- Development of the coconut biofuel strategy for Vanuatu.
- Development of the electricity roadmap to green hydrogen and ocean energy technologies for Palau.
- Support the NDC revision process and implementation assessment of the Bahamas National Energy Policy.
- Conduct energy data audit and capacity building on energy management and audit for Grenada.
- Development of Belize's baseline and mitigation scenarios for the energy sector using REmap.
- Development of mitigation scenarios for the energy sector; revision of national GHG target mitigation potential; development of GHG inventories and harmonisation with mitigation actions; and capacity building activities for the Dominican Republic.
- Revision of NDC mitigation targets and national climate plans for Saint Kitts and Nevis.
- Support for project facilitation in access to finance for Sao Tome and Principe, Samoa and Nauru.

Offshore renewables and ocean energy

IRENA's collaborative framework

IRENA's mission to increase effort in all fields of renewable energy has culminated in the establishment of a collaborative framework on ocean energy, as well as offshore renewables.

According to IRENA projections, offshore wind and ocean energy installed capacity could reach 228 GW and 10 GW respectively by 2030, worldwide, and will play an essential role in both global and SIDS energy transformation.

Participants in a collaborative framework on ocean energy/offshore renewables first met on 25 June 2020. At this meeting, IRENA members and states in accession provided inputs on the thematic scope of the collaborative framework and agreed to include relevant stakeholders in future meetings.

In response, the second meeting of the framework, moderated by HE Ambassador 'Akau'ola, Tonga's Permanent Representative to IRENA, included participation, insights, and support from the Global Wind Energy Council (GWEC) and Ocean Energy Europe (OEE).

Members also agreed on 13 topics of focus for the collaborative framework, around the areas of technology development, research and innovation, market incentives, and sustainability. The topics include analyses on accelerating technology cost reduction, grid integration, resource mapping, and coupling of offshore renewables with power-to-X technologies. Participants also indicated the important role of IRENA and the collaborative framework in moving a global offshore renewables agenda forward in other relevant multilateral venues, including the G20 and COP26.

Tonga's active participation as co-facilitator for the framework, together with Italy, ensures that SIDS maintain a crucial role and provide a key guide to the agenda of future discussions, with a view to expanding offshore technologies to SIDS and moving beyond the European context.



Renewables and digital transformation (telecommunications)

Photograph: Ministry of Environment, Maldives

Advancing energy transition through NDCs in Latin America and the Caribbean

In the run-up to COP26 and in collaboration with the United Kingdom's COP 26 Presidency, IRENA – together with its global and regional development partners – continues to discuss support for NDC enhancement and implementation with relevant countries.

One example of this is the recently concluded Latin America and the Caribbean (LAC) regional webinar entitled, *Advancing the Energy Transition in LAC through NDCs*. During this, government representatives from the Caribbean SIDS highlighted the challenges they faced during the enhancement phase of their first submitted NDCs. They also raised the challenges they will face in the foreseeable future, as they start implementing their NDCs. Climate change is a matter that concerns everyone. The need for appropriate measures to be undertaken that would make a difference, such as developing long-term energy scenarios and gauging appropriate technical and financial support from development partners, is therefore paramount.

The SIDS Lighthouses initiative plans to replicate this webinar in the Pacific region in 2021, in close consultation with key global and regional partners.

The SIDS Lighthouses initiative promotes renewables and advances the energy transformation in small island developing states.



Photograph: Shutterstock

From assessment and planning to effective solutions

The SIDS Lighthouses initiative continues to work towards expanding energy transition support. This requires moving from assessment and planning to the implementation of effective, innovative solutions, with continued technical and regulatory advisory services to help SIDS. While doing this, the initiative has developed a capacity building programme to strengthen power utilities and regulators in the design and negotiation of bankable power purchase agreements (PPAs) and contracts. These will lead to the effective commitment of private capital to the deployment of renewable energy projects in SIDS. This has kickstarted in the Pacific region, in partnership with the Pacific Power Association, the Pacific Community-Pacific Centre for Renewable Energy and Energy Efficiency, the World Bank and the International Finance Corporation. This capacity building programme will be replicated in the AIS and Caribbean regions in 2021, in close collaboration with regional and global partners.

Capacity building is essential when implementing bankable PPAs. These constitute a long-term contract between sellers and buyers of electricity to facilitate investment, specifically by defining each parties' rights, responsibilities, risks and remedies. PPAs are one of the most relevant contracts in the electricity industry and are being used for all generation technology types. Establishing bankable PPAs, however, requires high levels of certainty over issues such as connection, guaranteed off-take, predictable long-term revenues and possible curtailment events within an appropriate regulatory framework. This is one of the key components in establishing a robust development of renewable energy projects. Based on the inputs from regional organisations and from partners, it was observed that there is a need for support in developing the capacities of regional stakeholders in the financial aspects of PPAs.

Some key highlights from the capacity building programme in the Pacific were:

- Due to SIDS' small size, renewable energy projects also tend to be small and may not attract ideal developers, presenting challenges associated with screening bidders.
- The expected pipeline of future renewable energy projects is limited, with most considered to be stand-alone – an assumption reflected in high costs and low sustainability.
- Limited access to financing security or guarantees often poses a risk for renewable energy deployment by the private sector.
- It is imperative to have credible and reliable energy data for planning and forecasting, with this also key to attracting private sector investment and sustainability commitments.



Renewables installed on one of the Youth Centers in Male, Maldives

Photograph: Ministry of Environment, Maldives

Adopting and integrating all renewable sources

SIDS have a vast number of technologies to pick from, many of which are very well-suited to limited land space and the SIDS' geological, climatic and morphological characteristics. Hydropower, for example, can be developed on mountainous islands that have a high rainfall. Biofuels derived from coconut, palm or sweet sorghum oils would allow local economies to thrive, as well as reduce dependence on fossil fuel imports. Ocean energy derived from tidal action, waves, or algae is still in its infancy, but can reap natural and immense benefits for archipelagic states. Finally, islands located on overlapping tectonic plates in the Pacific and the Caribbean can exploit their geothermal potential. The SIDS Lighthouses initiative intends to promote all these renewable energy resources, which are often very specific to SIDS settings and can generate incremental benefits for their economies.

Collaboration on ocean energy development

Through the SIDS Lighthouses initiative and with financial support from Denmark, IRENA recently launched two publications: *Fostering a blue economy: Offshore renewable energy*, and *Innovation outlook: Ocean energy technologies*. These give the state-of-the-art in ocean energy markets and developments in technology, as well as the outlook for the next decade. The two publications contain analysis on innovative business models, the benefits of a blue economy and an inventory of projects, worldwide.



Innovation Outlook: Ocean Energy Technologies

Photograph: IRENA

In order to promote ocean energy through the SIDS Lighthouses initiative, IRENA has signed a memorandum of understanding (MOU) with SIDS DOCK. This is an initiative among member countries of AOSIS to help SIDS *dock* with global finance and carbon markets, in order to transform their energy sectors and address adaptation to climate change. One of the areas of co-operation included in the MOU is the pledge to kick off collaboration on capacity building in SIDS through ocean and marine sustainable energy webinars.

IRENA-ADFD Project Facility

IRENA, in partnership with the Abu Dhabi Fund for Development (ADFD), supports replicable and scalable renewable energy projects in developing countries through the [IRENA-ADFD Project Facility](#). The facility has committed USD 350 million to renewable energy projects recommended by IRENA in concessional loans over seven annual funding cycles. Over 16 projects in SIDS were selected. The list of projects below only reflects those that have been completed, or are currently being implemented in SIDS. The table also highlights the information on the type of renewable energy technology.

Table 4 **Some of the SIDS projects that are advancing under the IRENA-ADFD Project Facility**

SIDS name	Project name	Renewable energy technology
Antigua and Barbuda	Transformation and resilience building of the water sector	Solar PV and wind
Cuba	Grid connected solar PV project	Solar PV
Maldives	Waste to Energy Project: Vandhoo	Waste to energy
Mauritius	Deployment of 10 000 Solar Photovoltaic Kits Project	Solar PV rooftop
Saint Vincent and the Grenadines	La Soufriere Geothermal Energy Project	Geothermal
Seychelles	Ile de Romainville Solar Park	Solar PV
Solomon Islands	Tina River Hydro Power Project	Hydropower



IRENA-ADFD Facility: Grid connected solar PV project, Cuba

Photograph: IRENA

The SIDS Lighthouses initiative believes that it is vital to consider the nexus between renewable energy and non-energy sectors in SIDS economies. Indeed, renewable energy deployment in SIDS translates directly into lower dependency on imported fossil fuels. The savings related to this can then be redirected to other sectors of the economy and to home-grown industries utilising available resources – translating into higher productivity and better quality of services.

The two stories below from Puerto Rico and Seychelles highlight how SIDS and its development partners have been collaborating bilaterally to reinforce links between renewables and non-energy sectors – including agriculture, food, health and water. This has fostered broad socio-economic development, as well as raised awareness of job creation, gender equality and women’s empowerment through renewable energy development. The highlights were provided by the SIDS Lighthouses initiative partners, The Clinton Foundation and Greening the Islands.

Solar Saves Lives

Solar Save Lives is an initiative led by the Solar Foundation to install solar and battery storage in health clinics. Among its partners are The Clinton Foundation, the Rockefeller Foundation, Direct Relief, and others. More specifically, the initiative is currently working in Puerto Rico to supply renewable energy to seven health clinics in the hurricane-battered island. The installations were completed in the third quarter of 2020 through donations coming from foundations, industry partners, and private individuals.

The activity of the Solar Saves Lives initiative in Puerto Rico is continuing in the form of the Puerto Rican Solar Business Accelerator, which is a programme to incentivise the expansion of the solar industry on the island as a durable source of employment.

Seychelles Energy Commission Initiative

A winner of the Greening the Islands e-convention awards, this project aims to undertake the installation of PV systems for a capacity of approximately 4-5 kilowatt peak (kWp) at all the public schools located on the three main islands of Seychelles (Mahe, Praslin and La Digue).

This project is being implemented and facilitated by the Seychelles Energy Commission (SEC), in close collaboration with the Public Utilities Corporation and the Ministry of Environment, Energy and Climate Change, the Ministry of Education and their Eco School department, the Ministry of Finance and the Ministry of Land Use and Housing, along with sponsors, wherever applicable. In addition to powering a considerable share of the country’s education system, the project has additional socio-economic aims in mind:

- The reduction of greenhouse gas emissions originating from electricity generation.
- The creation of an interest in renewable energy among the children attending the schools, including future job opportunities in the sector.
- Promoting the advantages of PV solar systems to other public entities and households.

Developing bankable projects, ensuring access to finance, and fostering co-operation with the private sector

While the costs of renewable energy technologies have dramatically decreased in recent years, relatively higher capital costs still represent a barrier to scaling up renewable energy investments in SIDS. This issue has been addressed numerous times by relevant stakeholders from SIDS during IRENA's high-level dialogues. Particular topics raised as areas requiring urgent action include: the necessity to tailor funding options for SIDS; the request to revise international ODA rules to better suit SIDS realities; and the lack of available data to prove the bankability of projects.

Climate Investment Platform

IRENA intends to address the financing needs of SIDS through the [Climate Investment Platform \(CIP\)](#). This is a joint initiative of IRENA and other partners that aims to mobilise investments at the scale necessary to accelerate the deployment of renewable energy and assist countries to make meaningful progress in their climate objectives. Through CIP activities, IRENA aims to support its members on the ground in boosting investments in renewable energy projects, facilitating access to finance and providing de-risking solutions.

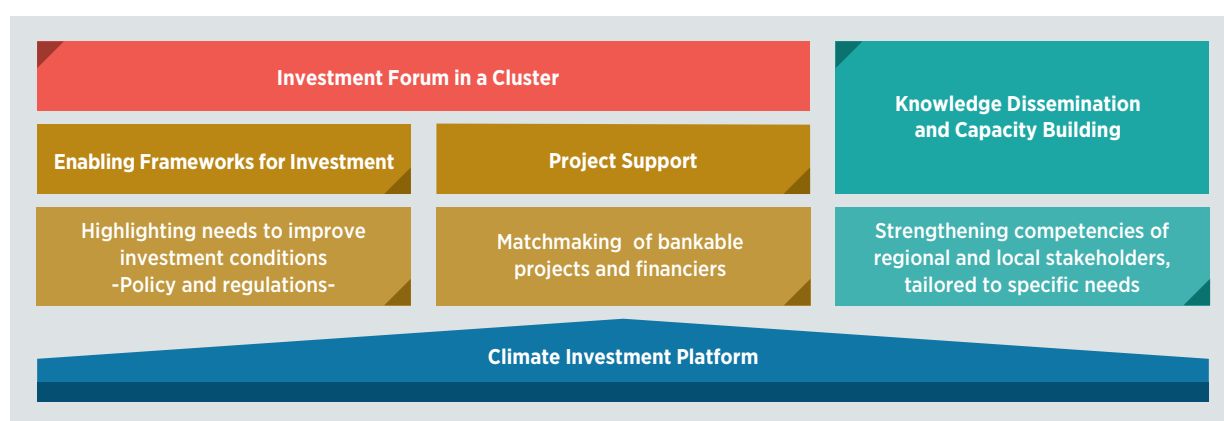
This can be achieved through investment forums addressing specific country and regional needs. In future, IRENA aims to host a series of regional investment forums designed to connect registered project proponents and governments with financial partners. This activity aims to identify areas of co-operation, as well as to strengthen the ability of decision-makers to develop strong enabling environments for renewable energy investments.

The forums will focus on two main areas:

- (i) Proposing ideas and plans to stakeholders, such as multilateral financial institutions, banks, investors, pension funds and non-governmental organisations (NGOs), with IRENA and partners following up to make promising projects and initiatives bankable;
- (ii) Collecting requests for technical support to help create the conditions necessary to attract private investment and capital.

The SIDS Lighthouses initiative will organise such investment forums for SIDS in the Caribbean and the Pacific. SIDS in the AIS region will be encouraged to participate in other regional investment forums across Asia and Africa.

Figure 5 **Structure of the Climate Investment Platform**



Building up human and institutional capacity across the value chain

Capacity building is a crucial factor in accelerating the deployment of renewable energy sources in SIDS, as well as a key priority for the SIDS Lighthouses initiative. Constantly highlighted by SIDS and initiative members as a key area where assistance is needed, capacity building is needed in building interventions in local financial institutions, as well as in vocational training for technicians. This would allow them to keep up with technological developments, which would lead to the development of a critical mass of local expertise.

The two stories below are examples of how sustained action on capacity building can bring about meaningful and lasting change:

- IRENA supporting Seychelles to strengthen its capacity in tracking climate investment flows through the SIDS Lighthouses initiative.
- Mauritius committing to strengthen capacities through the establishment of the Mauritius Renewable Energy Agency (MARENA).

“SIDS need assistance to overcome persistent obstacles, such as legal and regulatory barriers. We need access at the scale required and the necessary training and technology for sustained human and institutional capacity.”

Hon. Omar Figueroa, Minister for Environment and Sustainable Development, Belize, and chair of AOSIS

Assessment of investments and financial flows for climate change activities in Seychelles

Seychelles submitted its first NDCs in 2016, with the timeframe for their implementation ending in 2030. Seychelles climate pledges consider, among other things, the development of an NDC monitoring plan that will require a considerable strengthening of the capacity of government officials. In order to improve the management of the NDC implementation process, focusing on the energy component of the NDCs, Seychelles has requested IRENA's support in strengthening the capacity of the government ministry responsible for finance to better track and report the flow of climate funds in different sectors. These include energy, environment, agriculture, fisheries and tourism, which will also be incorporated in the national budgeting exercise. IRENA is currently completing the preparatory phase and aims to deliver the capacity building activity by 2021.

Accelerating the transformational shift to a low-carbon economy in the Republic of Mauritius

Mauritius, like other SIDS, is vulnerable to external energy shocks, with imported fossil fuels supplying about 80% of the country's primary energy needs. At the same time, the government has set an ambitious target of 35% renewable energy to supply its energy needs by 2025. MARENA is the new body tasked with promoting renewable energy and creating the necessary regulatory environment for its deployment. The agency elaborates five-year renewable energy strategic plans, contributes to strengthening capacity, advises relevant ministries on renewable energy policies, and establishes the necessary mechanisms and frameworks to increase Mauritius' energy transformation.

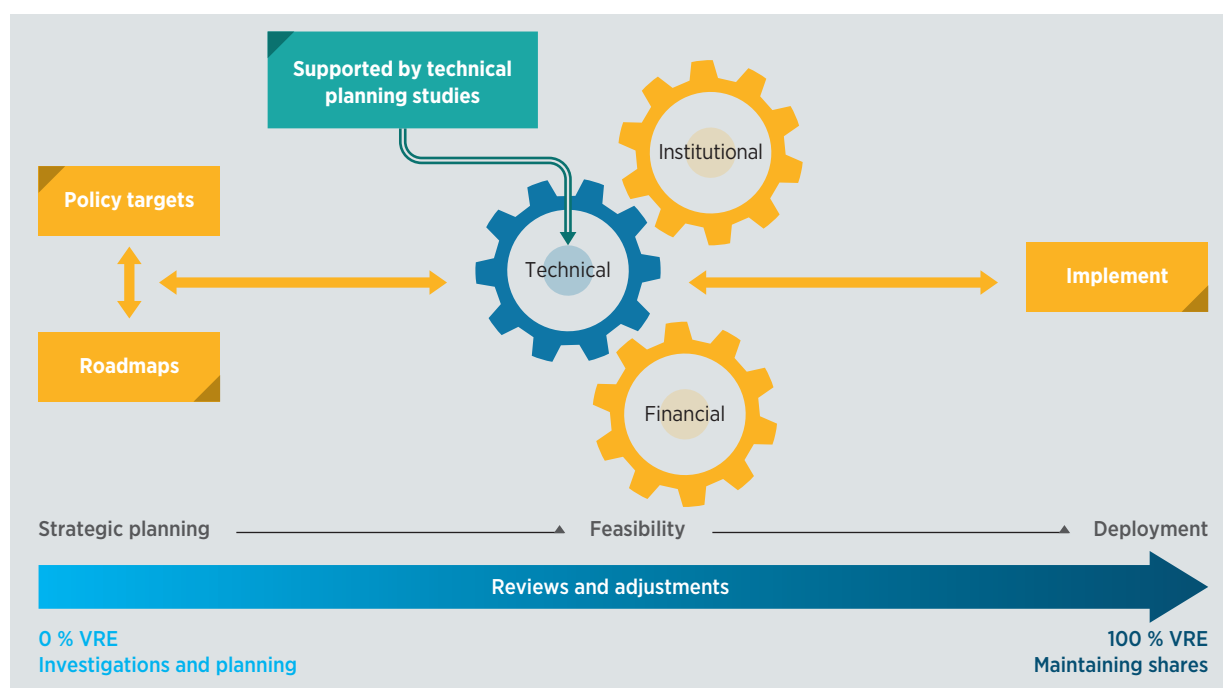
SIDS Lighthouses technical webinar series

Transforming SIDS power systems through variable renewable energy

SIDS face numerous barriers when integrating variable renewable energy (VRE) sources into their power systems, including a lack of local capacity to plan, operate and maintain those networks. In response, the initiative organised a webinar series composed of two separate streams, one for the Pacific region that was held on 29 October 2020 and one for the Caribbean that took place on 10 December 2020. These series provide insights into technical constraints when integrating VRE, while also providing solutions to mitigate these challenges and ensure a reliable power system.

Both webinar series saw a presentation of work undertaken by IRENA that highlights the lessons learnt from previous studies. The series also provided recommendations to participants from government agencies, utilities, regional organisations and NGOs. Moreover, they provided a stage for government representatives from both regions, as well as development partners, to illustrate their experiences.

Figure 6 **The role of technical planning studies in the transformation of SIDS power systems**



Source: IRENA (2019), *Transforming small-island power systems: Technical planning studies for the integration of variable renewables*



Renewables installed on one of the hospitals located in a protected area, Maldives

Photograph: Ministry of Environment, Maldives

Beyond power generation

Transforming transport and other end uses

Across all SIDS, 90% of transport depends on fossil fuel products, IRENA analysis indicates. Importing fossil fuels for power and transportation, as well as other end-use sectors, takes up large portions of SIDS budgets that could be directed towards other sectors. Energy import dependence, meanwhile, makes SIDS vulnerable to international oil price fluctuations.

IRENA is currently developing an e-mobility roadmap for Antigua and Barbuda. This assessment aims to provide a set of recommendations on the electrification of Antigua and Barbuda's transport sector, with a possible option of being powered through 100% renewable energy. The stories below report on efforts undertaken by SIDS, along with other partners, to green their transportation sectors

Sustainable transport sectors in Grenada and Barbados

Attention to these types of projects in Caribbean SIDS is increasing, with countries both requesting assistance to meet their targets, or setting the pace for others to follow. Grenada's Vision 2030, for example, focuses on renewable energy, but also aims to make the transportation sector more sustainable, setting the objective of 100% green transportation by 2030. A commitment to reducing GHGs from the transport sector is also enshrined within the country's new NDC, requiring additional support.

Barbados, meanwhile, has kickstarted what some observers deem a 'revolution' in its transport sector, in terms of electric vehicles per 1000 inhabitants. With 100% renewable energy by 2030 being the national target, the government has committed to incentivising renewable energy transportation. This has resulted in the purchase of over 390 privately-owned purely electric vehicles.



Photograph: Shutterstock

The Pacific Blue Shipping Partnership

Efforts are being undertaken in the Pacific to achieve increased sustainability in shipping routes. Shipping is a crucial sector for the island countries of the Pacific, which rely on maritime transportation to supply all their essential services. A coalition of regional partners, including the Pacific Islands Development Forum, the University of the South Pacific, the International Union for the Conservation of Nature, and the World Wildlife Fund, under the co-ordination of the governments of Fiji, the Marshall Islands, Samoa, Vanuatu, Solomon Islands and Tuvalu, has committed to an initial emissions reduction target for Pacific shipping of 40% by 2030, and full decarbonisation of the sector by 2050.

Synergies between renewables and energy efficiency

Energy efficiency – and its application in various end-use sectors – is closely linked with increasing renewable energy capacity. Reducing, managing and increasing the efficiency of SIDS energy consumption is the quickest and cheapest way to achieve the highest returns on investments for energy transition. Energy efficiency and conservation also contributes to climate change mitigation and enhancing energy security through optimum energy usage, with the appropriate policies and standards in place. A lack of available data and inadequate local capacity, however, often make it difficult to implement energy efficiency measures in SIDS.

Developing Grenada's capacity building programme for energy management and energy audits

An energy audit is needed to identify usage patterns and recommend the most efficient management of energy for an identified scope of works. The audit identifies, quantifies and reports on opportunities for improving energy efficiency and the performance of appliances. It also assesses the energy flows into a building, process or system and identifies possible ways of reducing the energy use, whilst maintaining and improving human comfort, health and safety.

Through the SIDS Lighthouses initiative, IRENA is launching a capacity building exercise in Grenada, aimed at developing training manuals and materials for energy auditing in the Caribbean state. The training sessions will strengthen Grenada's capacity to undertake energy audits. It will focus on practical, technical and financial analysis to determine energy cost-saving measures in various sectors. This can then form the basis of bankable projects that can be shared with development partners for funding and implementation.

Japan's efforts to promote energy efficiency in Jamaica

The story below represents the work being done in Jamaica in co-operation with the Government of Japan.

The Japanese government is currently active in Jamaica, introducing energy-saving technologies and equipment in public facilities and providing support to establish an urban traffic management system in the Kingston area. The loan funds amount to a total of USD 15 million. This has been allocated for the procurement of air conditioning equipment, boilers, LED lighting, solar light panels and other services. The latter include consulting with public facilities on energy efficiency measures, construction to install the equipment, and the procurement of optic fiber cables, traffic signals, cameras and sensors.

The project will help Jamaica attain its objective of reducing fossil fuel imports, according to its long-term plan of achieving energy security and efficiency. Currently, Jamaica is dependent on fossil fuel imports for more than 90% of its energy resources, according to the Japan International Co-operation Agency, and has turned to the promotion of energy efficiency measures to reduce import volumes and redirect funds to other sectors of its economy. The two sectors that are being targeted are of importance given their current levels of energy consumption. The public sector accounts for 13% of all the power consumed in the country, while it is estimated that improving the efficiency of the transportation sector will reduce fuel consumption by approximately 40%.

Renewables, climate resilience and disaster recovery

Some SIDS are prone to natural disasters, such as hurricanes or earthquakes, which, in addition to their human toll, cause severe economic disruption and disconnection of supply lines. This is particularly evident during the annual hurricane/cyclone season, when fuel vessels may need to be re-routed to avoid storms, or when storage facilities are damaged. Additionally, SIDS power systems are often unable to keep up with load demand during these events, leading to power outages. Working on the link between renewable energy and climate resilience ensures that SIDS energy systems remain more resilient to the impact of climate change, as well as enabling them to use renewable energy to accelerate economic recovery after natural disasters.

Caribbean regional workshop in Aruba: How to strengthen resilience and accelerate renewable energy deployment in SIDS

Under the SIDS Lighthouses initiative, IRENA partnered with the Kingdom of the Netherlands and the Aruba Centre of Excellence (COE) for the Sustainable Development of SIDS in hosting and delivering the Caribbean regional workshop focusing on the theme of renewable energy and climate resilience. The workshop saw the participation of 39 senior officers from energy ministries, public utilities and development partners in the Caribbean SIDS who are involved in planning and strategising for the energy sector, and addressed the following key issues:

1. Integrating resilience into renewable energy projects is key. Current practices in this area include undergrounding transmission and distribution for key infrastructure; a wider extension of critical national infrastructure; the diversification of renewables; and using equipment with higher disaster ratings.
2. Innovative financing options need to be developed to facilitate resilience, through strengthening capacity, the establishment of a regional project preparation facility to facilitate design, and the bundling of projects.
3. Providing technical support in policy and fiscal development; institutional capacity; planning for new power investments and integrated disaster management.
4. Public awareness and information sharing must be boosted to a wider audience and stakeholders.
5. Strengthening capacity in negotiating PPAs and other legal contracts related to the power sector and negotiations with geothermal developers.
6. The political setting of renewable energy targets must be balanced with the reality on the ground of what is possible from a technical, financial, physical, environmental and socially acceptable perspective.

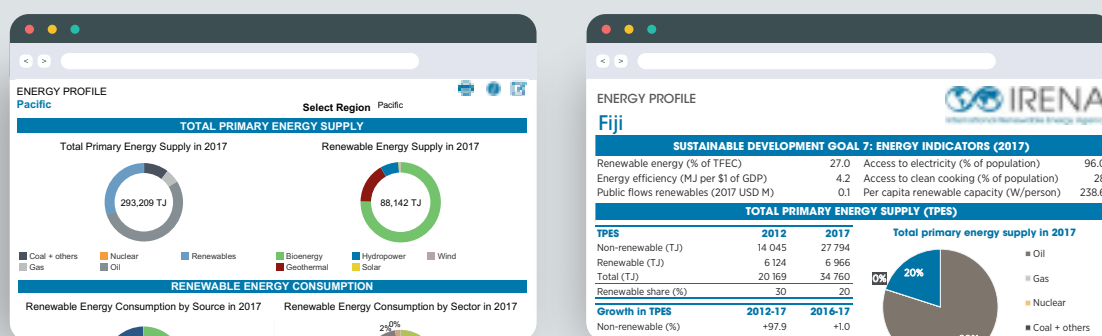
Through the SIDS Lighthouses initiative, and with financial support from Denmark, IRENA has published a report entitled [Quality Infrastructure for Smart Mini-Grids](#). The report highlights the crucial role of quality infrastructure (QI) for the development of smart renewable mini grids. Grid-connected mini grids can increase power system resilience and reliability, while facilitating the integration of solar and wind power. Meanwhile, renewable mini grids far off the main grid can provide reliable electricity access for remote areas and islands.



Data and statistics for effective monitoring and informed decision making

Access to data remains a critical challenge when assessing the bankability of renewable energy projects in SIDS, as well as when conducting energy audits, or promoting capacity building initiatives. Additionally, lack of data makes it more difficult to plan and implement efficient policies. Supporting SIDS in the collection of data is one of the key priorities of the SIDS Lighthouses initiative.

Through its SIDS Lighthouses initiative, IRENA collects data and statistics on SIDS, tracking their progress in renewable energy capacity. The information can be viewed on the [initiative's website](#) in the form of regional and country profiles. These include a wide range of information on SIDS, spanning from the share of renewable energy in total final energy consumption to information on the energy trade.



Renewable energy profiles by region and country

IRENA also collects and tracks data on SIDS renewable energy targets, including targets enshrined in SIDS' NDCs. This is a crucial part of IRENA's support for SIDS NDC enhancement and implementation.

The data can be found in the following databases:

[IRENA Statistics](#) for data on installed renewable energy capacity

[IRENA Costing](#) for data on the costs of new renewable energy technologies

[IRENA-IEA Policy Database](#) for information on existing policies aimed at accelerating the energy transformation.

"At times of crises, international co-operation and multilateralism are most important to forge durable and enduring partnerships and building with renewables is the best remedy to address the post-pandemic and climate crises."

HE Dr Hussain Rasheed Hassan, Minister of Environment, Maldives

Engagement with partners and stakeholder platforms

Regional and global collaborations

The SIDS Lighthouse initiative's efforts to accelerate SIDS energy transformation also include establishing partnerships and agreements with other international organisations and development partners.

Important MoUs, such as with the UN-OHRLLS, OEE and the Caribbean Community (CARICOM) Development Fund ensure that IRENA maintains a constant focus on all areas of the energy transformation in SIDS, as well as regional co-operation and the uptake of the multiple renewable energy technologies.

SIDS are also at the forefront of IRENA's work on the nexus between energy and health, with projects in the pipeline to conduct assessments of the health systems in Nauru and Samoa. IRENA will continue exploring options for co-operation with other SIDS to reduce the dependence of their health systems on fossil fuels.

IRENA has partnered with the Pacific Community to establish a regional focal point that will co-ordinate IRENA's activities in the Pacific region. The two organisations will also work together in accelerating a regional energy transformation that will enhance pandemic and natural disaster recovery efforts. Current efforts are underway with regional organisations in the Caribbean to establish a similar agreement.

Global Geothermal Alliance

IRENA actively promotes geothermal energy development in SIDS through the Global Geothermal Alliance (GGA), IRENA's platform for dialogue, co-operation and co-ordinated action between the geothermal industry, policy makers and stakeholders. The platform stimulates the adoption of geothermal energy through various means, including: fostering a suitable environment to attract investments; providing customised support to member countries; and facilitating the exchange of experience and know-how among key stakeholders.

The GGA now includes 46 members, including seven SIDS (Comoros, Fiji, Papua New Guinea, Saint Vincent and the Grenadines, Solomon Islands, Tonga, and Vanuatu). The alliance has been operating in the Caribbean region in particular, through a programme led by the Caribbean Development Bank (CDB), known as the CDB GeoSmart Initiative. This promotes geothermal power in the five eastern Caribbean nations of Dominica, Grenada, Saint Kitts & Nevis, Saint Lucia, and Saint Vincent & the Grenadines. It does this through the development of local geothermal power plants and transmission lines, exploration drilling, and capacity building activities.

SIDS Lighthouses knowledge-sharing platform

A dedicated section of IRENA's website <https://islands.irena.org/> features tools, studies, videos, key events and a wealth of information on the energy transformation in SIDS. Country profiles currently under development will provide an overview of key indicators, renewable energy status and recent initiatives and programmes in each of the initiative's SIDS partners.

SIDS Lighthouses web pages highlight relevant publications from SIDS partners, including recent reports from Tonga, Saint Vincent and the Grenadines, Maldives and Saint Lucia.

The initiative, meanwhile, has expanded its social media presence, adding a dedicated LinkedIn page in September 2020.



Active web presence and increasing social media engagement



The IRENA Director-General was also invited by France – an SIDS Lighthouses initiative partner – to record a video on the occasion of the 5th Anniversary of the Paris Agreement. The Director-General detailed the work being done by the initiative to support SIDS NDC enhancement and implementation, supporting an energy transformation that will help SIDS fulfilling their commitments under the Paris Agreement and the 2030 Agenda for Sustainable Development.

IRENA tools and advisory services

Renewables Readiness Assessment

The Renewables Readiness Assessment (RRA) is a country-led, comprehensive tool for holistic evaluations and recommendations for action to accelerate renewable energy deployment.

CIP and investment forums

The CIP is a global initiative by IRENA, the UNDP and SE4All, in co-operation with the Green Climate Fund (GCF). The platform aims to mobilise investments at the scale necessary to achieve meaningful progress towards climate objectives. The CIP will initially focus on energy transition, with the goal of accelerating investments in renewable energy and enabling the realisation of the ambitious Nationally Determined Contributions (NDCs).

IRENA collaborative frameworks

IRENA's collaborative frameworks on ocean/offshore renewables, as well as high shares of renewables, are new tools being implemented by the agency. They aim to enhance and streamline co-operation among member states regarding important topics that will dictate the future of energy transformation. Co-ordinated by select co-facilitators, discussions under these frameworks will aim at dictating policies and instruments to sustain the deployment of ocean energy and offshore renewables, while ensuring that local grid systems are able to cope with the introduction of VRE sources.

The Global Atlas

The Global Atlas for Renewable Energy is a free, online resource-assessment tool with maps on solar, wind, ocean and bioenergy resources. It also facilitates a first screening of sites and areas for renewable energy investment opportunities.

Renewable Energy Roadmap (REmap)

REmap determines the realistic potential for countries, regions and the world to scale up renewables in order to ensure an affordable and sustainable energy future.

RENEWABLES READINESS ASSESSMENT

Global Atlas
FOR RENEWABLE ENERGY

Open solar contracts

IRENA and the Terawatt Initiative (TWI) have teamed up to support the rapid and widespread scale-up of solar energy in line with goals of the Paris Climate Agreement and Sustainable Development Goals. Open solar contracts streamline project development and finance processes by offering simple and universally applicable legal agreements that make contracting much faster and less costly.

Grid integration analysis

IRENA's grid integration work supports policymakers and public utilities from SIDS address and overcome technical constraints associated with the operation of electricity grids with high shares of VRE, such as solar and wind energy.

Quickscans

The Quickscan is a tool to help SIDS in their transition to renewable energy. Developed by IRENA as part of the SIDS Lighthouses initiative, Quickscans help to assess deployment conditions, monitor progress and identify areas where targeted assistance could accelerate the transition to renewables.

Data and statistics

Detailed, accurate and timely data and statistics are essential for the monitoring and evaluation of renewable energy policies and deployment. IRENA helps analysts, policy-makers and the public make informed decisions by providing access to comprehensive and up-to-date renewable energy data.

Renewable energy costing

By improving the quality of renewable cost data and analysis in the public domain, IRENA is working hard to provide up-to-date information on renewable energy technologies, their costs and cost reduction potential to all stakeholders.

“Despite limited scale and a lack of conventional resources, many small island societies have set out to transform their energy systems, create new economic opportunities and strengthen climate resilience using indigenous renewables. The SIDS Lighthouses initiative aims to support and strengthen these ambitions and help to build a climate-safe island energy future.”

Francesco La Camera, IRENA Director-General



The SIDS Lighthouses initiative supports global, regional and national-level actions to assist small island developing states fulfil their commitments under the Paris Agreement and the 2030 Agenda for Sustainable Development.

For more information, visit the **SIDS Lighthouses** website: [HTTPS://ISLANDS.IRENA.ORG/](https://islands.irena.org/)
or the **LINKEDIN** page or contact ISLANDS@IRENA.ORG

About IRENA

The International Renewable Energy Agency (IRENA) serves as the principal platform for international co-operation, a centre of excellence, a repository of policy, technology, resource and financial knowledge, and a driver of action on the ground to advance the transformation of the global energy system. An intergovernmental organisation established in 2011, IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy, in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity. www.irena.org

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